R E P O R T R E S U M E S

ED 003 924 48

STEP-BY-STEP PROCEDURES FOR LANGUAGE LABORATORY PLANNING, SOME SUGGESTIONS FOR SCHOOLS AND COLLEGES.

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REPORT NUMBER NDEA-VI-2-2 PUB DATE 60
CONTRACT OEC-SAE-8342
EDRS PRICE MF-$0.09 HC-$0.72 18P.

DESCRIPTORS- *LANGUAGE LABORATORIES, *LANGUAGE LABORATORY EQUIPMENT, *AUDIO EQUIPMENT, NEW YORK CITY, NEW YORK

A SEQUENCE OF STEPS FOR ESTABLISHING LANGUAGE LABORATORIES ARE DELINEATED IN THIS REVISED PAPER. THE ORIGINAL PAPER WAS PRESENTED TO THE MODERN LANGUAGE ASSOCIATION CONFERENCE IN NEW YORK CITY ON THE "LANGUAGE LABORATORY IN HIGH SCHOOLS" (OCTOBER 1960). INCORPORATED IN THE REVISED PAPER ARE MANY SUGGESTIONS MADE BY THE CONFEREES, REPRESENTING A CONFERENCE CONSENSUS. THIS DOCUMENT IS PART OF A SERIES, ED 003 919 - ED 003 924, AND ED 003 926. (LP)

ED003924

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SAE-8342

THE MODERN LANGUAGE ASSOCIATION OF AMERICA

FOREIGN LANGUAGE PROGRAM RESEARCH CENTER

70 FIFTH AVENUE · NEW YORK 11, N. Y. · CHELSEA 3-4266

Step-by-Step Procedures for Language Laboratory Planning

Some Suggestions for Schools and Colleges

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U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
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Introductory note: This paper was presented to the MLA Conference on the Language Laboratory in High Schools, New York, October, 1960. The present revision incorporates many of the valuable suggestions made by the participants, and now represents the consensus of that conference. Any inaccuracies, of course, remain the responsibility of the writer.

It is a fact that many language laboratories have come into being out of something less than a careful consideration of all their implications. In colleges and universities, administrative pressure has sometimes urged a language laboratory upon a less than enthusiastic and sometimes unprepared foreign language staff; in secondary schools, the availability of NDEA Title III funds, and the time pressures resulting from the necessity of integrating local needs with state procedures, have often led to hasty action. The purpose of this presentation is to suggest to both school administrators and language teachers a single sequence of planning procedures which at the same time provides a rapid review of all the problems which require study: administrative, pedagogical, technical. It is obvious that the actual sequence will have to be modified, sometimes drastically, to fit local and state conditions, but it is likely that total disregard of any step will operate to the detriment of any program. At a number of points, it seemed that something more than a note or comment was required; where feasible, an expanded treatment has been appended in the form of a short essay.

Although these suggestions must be concerned primarily with equipment planning as it applies to the problems of the first level of language instruction, it should be emphasized that electro-mechanical aids will play an important role at subsequent levels as well.

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The presentation is keyed to representative selections from the many fine publications covering various aspects of a field whose literature is growing almost daily. Reference to these books and articles is by the last name of the author, where appropriate.

Bowen, J. Donald, "The Modern Language Association College Language Manual Project," PMLA Vol. 73, No. 4, Part 2, September 1959, pp. 20-26.

Brooks, Nelson, Language and Language Learning, Harcourt Brace & Company, New York, 1960.

Delattre, Pierre, "Testing Students' Progress in the Language Laboratory," in Language Teaching Today, ed. Felix J. Oinas, Bloomington, Indiana, 1960. (IJAL, Vol. 26, No. 4, Part II, - Publication 14 of the Indiana University Research Center in Anthropology, Folklore, and Linguistics.) Reprinted in Automated Teaching bulletin of the Rheem-Califone Corporation, Los Angeles, California, Vol. 1, No. 3, Summer 1960, pp. 21-31.

Marty, Fernand, Language Laboratory Learning, Audio-Visual Publications, Wellesley, Mass., 1960.

O'Connor, Patricia, Modern Foreign Languages in High School: Pre-reading Instruction, U. S. Office of Education Bulletin 1960, No. 9, OE-27000, Washington, 1960.

Purchase Guide for Programs in Science, Mathematics, Modern Foreign Languages. Prepared by the Council of Chief State School Officers, with the assistance of Educational Facilities Laboratories, Inc., and others. Ginn and Company, 1959. (A Supplement to the Purchase Guide is to be available in early 1961.)

Stack, Edward M., The Language Laboratory and Modern Language Teaching, Oxford University Press, New York, 1960.

PROCEDURES	NOTES AND COMMENTS
1. The foreign language (FL) staff of the local school or school system must participate in language laboratory (LL) planning, along with key administrative personnel, and such others as may be appropriate in the local situation. This group will be referred to as "the committee".	An LL, as a collection of equipment, does nothing by itself. It is at its weakest when it is merely superimposed on traditional instructional practices. The success of any FL program using electro-mechanical aids involves much more than eventual teacher control of knobs and switches. No satisfactory answer to LL problems can be found without careful reconsideration of course objectives, the nature of language and language learning, and the state of teacher preparation. All of this requires FL staff participation at every turn.
2. An administrative member of the committee should obtain from a number of schools which already have LL's a brief statement of their equipment and maintenance costs. This information is required so that, if there are to be local budgetary restrictions, they can be made known to all concerned at the start. Even very small sums can be spent wisely; elaborate and expensive equipment may prove to be unnecessary and even inadvisable.	Do not consult commercial sources at this early stage. One needs to know merely how many student positions with what equipment (headphones, microphones, recorders) and how many different lesson sources ("channels") were furnished for how many dollars. Maintenance costs will normally be 3 - 5% of the total investment.
3. Each committee member should be familiar with at least the basic literature in the field of FL teaching and learning. Suggested readings are: Brooks, especially chapters 2, 4, 5, 8; O'Connor; Bowen; "Modern Foreign Languages in the Comprehensive Secondary School", PMLA Vol. 73, No. 4, Part 2, September 1959, pp. 27-33; various announcements concerning the FL program of the MLA -- see PMLA, Directory issue, September 1960, p. 153 for references.	The pertinent literature is of three general types, with considerable overlap: (1) basic treatments of language, and language teaching and learning; (2) discussions of classroom and laboratory procedures, including the design of materials; (3) technical specifications. Broadly overlapping these three types are commercial brochures and supplementary publications. It is best to avoid the latter at this stage. See next page for a statement of general principles which the suggested readings might yield.

Expanded note to Step 3, page 3:

There is reasonably general agreement on the following points concerning the first level of foreign language instruction. These principles and procedures are valid without reference to the use of electro-mechanical aids. In practice greater efficiency can be achieved by relegation of a good deal of the highly repetitive work to the language laboratory or its equivalent.

1. Learning proceeds in this order: (1) hearing and understanding (i.e. listening and listening comprehension); (2) speaking; (3) - usually much later - reading; (4) writing. The tendency is therefore away from "book-centered" materials, and toward extensive audio-lingual practice designed to develop a new set of habits.

2. Instruction proceeds in the initial stages without reference to the printed word. For a discussion of the length of the "time-lag" between audio-lingual presentation and drill, and the presentation of the written forms of the same material, see Marty, pp. 75-6.

3. Teaching pronunciation requires extensive hearing of the new sounds, followed by careful drill in their production.

4. Language, here used in the linguist's sense of "talk", is initially presented and practiced in what are called pattern sentences or model sentences. Each pattern sentence contains a productive structure. Pattern sentences are subsequently manipulated in drills designed to highlight changes in form or order which occur within the structures.

NB. A productive structure is one which, when mastered, will permit the generation of new utterances by substituting new vocabulary, e.g. subject-verb-object in English. The words which can fill the "slots" of such structures may have different forms and orders, depending on the "obligatory categories" of the language, e.g. gender, number, case, agreement, tense, etc.

Those interested in the linguistic principles on which this drastically compressed statement is based, may wish to consult Simon Belasco et al.: Manual and Anthology of Applied Linguistics, a text for language teachers, prepared under a U. S. Office of Education contract. A preliminary version was used in the NDEA summer institutes in 1960, is now undergoing revision, and is to be available for general distribution in the summer of 1961.

5. Pattern sentences may or may not be presented originally in dialogue form. The dialogue has the advantage of immediate situational and possibly cultural appeal. Students enjoy them. They are more easily learned than isolated sentences because of the built-in prompts provided by the situation. The demands on writers of materials, however, are severe, since they must simultaneously achieve situational validity, a manipulable sequence of structures, and, a point sometimes overlooked, a choice of vocabulary which can be cumulatively substituted in previously learned patterns.

6. Pattern sentences are practiced to the point of "overlearning", i.e. until they become reflex-like habits. It remains a challenge to the teacher to keep them from losing all meaning in the process.

7. Drills, called pattern drills or structure drills, following the overlearning of pattern sentences, are of three basic types: (1) repetition drills; (2) drills which practice form and order changes; (3) drills which encourage the generation of new utterances by substituting new vocabulary. Many sub-types are used. See Brooks, pp. 211-215; O'Connor, pp. 18-32; Stack, Chapter III; Bowen, pp. 20-26; Delattre, pp. 18-32. An important principle in generalizing form and order changes is that of analogy: e.g. ich sage, ich arbeite, ich gehe ..... (hence) ich mache.

8. Translation back and forth between the foreign language and the native language is generally avoided.

4. Now consider as a working principle that it is the function of an LL, or any electromechanical equipment used in FL teaching, to provide frequent, regular practice, using recorded native or near-native models, on materials completely integrated with carefully planned classroom procedures.

See FL Program Notes, PMLA Vol. 75, No. 3, December 1960, pp. v-vi.

5. In order to arrive at practical solutions to the pedagogical and administrative problems a revision of the FL program will entail, it is wise to tackle immediately the problem of making available suitable audio-lingual instructional materials. This is more important than the actual choice of equipment, and the course of the whole program will be smoother if a plan is worked out in some detail at this point.

The materials problem demands an expanded presentation which follows on page 4a.

6. Try to get an agreement with the administration not to buy any equipment on the basis of price alone.

It is dangerously prejudicial to the most carefully planned program to assume that buying LL equipment is like buying any other school equipment. If a projector does not meet specifications, the picture may be a little darker, or the machine may be noisier; it would be difficult, however, to measure the effect on the program of which it is a part. If LL equipment does not meet specifications, it can ruin the program. All manufacturers claim to meet specifications and to supply the best equipment at the lowest cost.

7. Write to a number of the LL companies, requesting their brochures. The magazine Tape Recording (101 Balto-Annapolis Blvd., Severna Park, Md.) October 1960, pp. 34-37, has a nearly complete list.

Steps 7, 8, and 9 are preparation for meaningful participation in Steps 10 and 11 below. Avoid visits from salesmen until Step 14.

Note to Step 5, page 4:

Normally, a teaching staff should not be expected to create complete audio-lingual instructional materials, any more than they are expected to write their own textbooks in other areas of instruction. Good materials are in preparation under various auspices. By the fall of 1961, for example, under a contract with the U. S. Office of Education, the Glastonbury Public School System of Glastonbury, Connecticut, is expected to have produced for distribution through commercial channels audio-lingual instructional materials at Level I, Grades 7, 8 or 9, in five languages. On the college level, the MLA-sponsored Modern Spanish was published by the Harcourt Brace Company in early 1960, and can be used as a model for the preparation of similar materials in other languages. But until a much wider selection of good audio-lingual instructional materials in the necessary languages is at hand, some local preparation of such materials will probably be necessary. The determination of the extent of such local preparation requires evaluation of available materials: texts, tapes, and discs.

To find out what is available, consult the Materials List for Teachers of Modern Foreign Languages, ed. Douglas W. Alden, New York, 1959, which can be obtained from the Modern Language Association Research Center, 70 Fifth Avenue, New York 11. This publication is now undergoing extensive revision. A more recent list can be found in Tape Recording, October 1960, pp. 39-45. See Step 7, page 4, for address.

Obtain from the publishers sample texts, and, where possible, accompanying tapes or discs. The principles enumerated at Step 3 can serve here as a kind of check list against which one can make a rough estimate of the acceptability of a given text, or determine how difficult it would be to adapt it. Most important in this connection will be an MLA-sponsored bulletin, to be available in the near future, of criteria intended for teachers, writers, publishers of new material, and those seeking to evaluate existing materials. Read also: Stack, Chapter II; O'Connor, pp. 10-18; Brooks, Chapter 10.

Commercial tapes must be avaluated both pedagogically and technically, i.e. for reasonable conformity with the points enumerated at Step 3 and in the cited literature, as well as for sound quality -- ready distinguishability of fricative consonants; naturalness and pleasantness of the voices; freedom from excessive brackground hiss on the tape. In general, reject tapes which simply reproduce the material of the traditional text verbatim.

The most common practical interim solution will be that of preparing recorded drills for an existing text. See references above. For a discussion of scripts and recording procedures, read Brooks, pp. 152-155; Stack, pp. 37-38, 46-47; Marty, pp. 155-56.

Of great administrative importance is an estimate of the teacher time required for materials preparation, so that adequate provision for additional staff time can be made well in advance. A rough rule of thumb: multiply the number of lessons or chapters or units in the text under consideration by twenty for an estimate of the number of man-hours required to write drills and record them.

Note: If the Steps and Notes are being read in sequence, continue now with Step 6, page 4.

8. Read the Purchase Guide, p. 26, and pp. 263-271. As commercial brochures are received, each committee member should be assigned one or more for study. Do not worry yet about technical language or comparative specifications.

The purpose of this step is to become familiar with the functions and kinds of flexibility available in commercial packages.

9. Visit one or more language laboratories in action. Ask questions, take notes, and listen to the quality of the sound reproduction at several student positions. Inquire about maintenance problems.

10. Given the approximate costs and local budgetary limitations obtained at Step 2, an answer should be found to this question: Is a commercially packaged LL a suitable answer to the problem of implementing the working principle stated at Step 4?

Three criteria can be invoked to provide an answer. They are enumerated and discussed on page 5a below.

11. Should it appear that the committee will recommend the *installation of* a commercial LL or similar arrangement of equipment, it should consider at this point the general question of laboratory administration from the point of view of estimating the staff time required. See Purchase Guide, pp. 274-275; Stack, Chapter VI, Marty, pp. 175-179.

12. The committee should now be ready to draw up a tentative blueprint for a practical revision of the FL program. It should include: (1) a brief statement of the pedagogical principles on which the revision is based; (2) a list of courses affected; (3) a plan which will provide the necessary instructional materials; (4) a discussion of staff requirements; (5) a list of equipment, identified by type and function, but without technical specifications.

At this time problems of staff, schedule, space, and budget should be carefully reviewed. Consider the need for budgetary provision for these items: (1) 3 to 5% of the total investment for a maintenance program; (2) operating expenses -- laboratory materials and supplies; (3) professional consultancy; (4) hiring outside speakers to voice tapes if necessary; (5) staff time for materials preparation, laboratory administration, and testing and approval of the completed installation.

(Continued on page 6)

Note to Step 10, page 5:

Three criteria* can be invoked to provide an answer to the question posed at Step 10:

(1) Student coverage: Equipment should be provided to allow at least 20 minutes use per day per student at the first level of instruction. Estimates of equipment needed to provide this coverage should include provision for continued use on subsequent levels, although this allocation depends on the course of local FL program development, and probably cannot be precisely determined at this time. Be sure to allow 10-20% extra units for spares. The criterion of student coverage may dictate the purchase of equipment far simpler than what is usually called a "laboratory." Effective use of good materials can begin with a single tape recorder in each classroom. An intermediate stage, which completely eliminates scheduling difficulties, is a form of what is sometimes called an "electronic classroom." Such an arrangement, which can be much less expensive than the fully equipped laboratory, involves, minimally, equipping each language classroom with a tape recorder and disc playback, plus headphones for each student.

(2) Course coverage: Plans should include access to enough tape recorders to assure adequate testing of oral facility in the FL. If this competence is not tested regularly, students won't work at it. This usually means access to a number of tape recorders equal to 1/4 of the membership in the largest FL class.

(3) Extended coverage: Only if the first two criteria have been budgetarily accounted for, should this criterion be invoked. Since the 20-minute daily requirement above will not usually extend the total time available for contact with the language, provisions should be made for additional contact in the form of "homework" practice. Colleges may satisfy this requirement with library-type installations, i.e. one in which materials are available in all courses on a library schedule. Secondary schools, with their more rigid time schedules, may find a more practical answer in the use of inexpensive homework discs.

Note: If the Steps and Notes are being read in sequence, continue now with Step 11, page 5.

* These criteria, here somewhat differently annotated, were first presented by A. Bruce Gaarder in a paper delivered at the Secondary School Language Laboratory Conference, University of Michigan, Ann Arbor, Michigan, October 1960.

13. Employ on a short-term consultant basis a recognized authority in the LL field to review the committee's program, to clarify technical matters, to indicate what technical specifications should be stressed, to correlate the program with available equipment, and, if a simple installation is indicated, include technical provision for subsequent expansion. This consultation, or sequence of consultations, should produce a practical plan for an equipment-implemented program.

14. Salesmen and manufacturers' representatives may now be invited to demonstrate their systems.

Note to Step 12, continued:

See also Steps 13 and 18 below.

Include in the equipment list, especially if the staff is to prepare recorded drills, one professtional-type tape recorder, at least of the quality of the Ampex 900-series, preferably an Ampex PR-10. Also include one good dynamic microphone, Electro-voice #636 or better.

If NDEA Title III matching funds are involved, be sure of the deadline for presenting the local program to the state. Obtain from the State Department of Education or State FL Supervisor the often excellently detailed materials on LL specifications and procedures for purchase; these should be made available to the consultant in advance of actual consultation. He will be familiar with the Purchase Guide recommendations, pp. 274-281. Professional consultancy can, of course, be used earlier in the proceedings, but personnel both qualified and available to take over the whole job hardly exist. Any use of consultants can be frustrating if the staff is not reasonably prepared. One must be able to ask the right questions. The consultant himself should not be commercially affiliated. LL directors and FL personnel at other schools, colleges and universities are often available for short-term service.

15. The committee should see that the purchasing agent, or those responsible for negotiation of the actual purchase of equipment, has read the Purchase Guide, pp. 279-280, as well as the recommendations obtainable from the appropriate State Department of Education.

Refer again to Step 6 and accompanying note. It is recommended that the warranty required take the form of an agreement by the manufacturer to furnish free parts and labor maintenance for one year from the date of completion. Manufacturers should be required to submit information on the kind of service contract they offer after the warranty period, but the school should be free to negotiate a separate contract with a local agency, if feasible, since there are obvious advantages to such an arrangement. The services obtainable under such a contract should not be confused with the need for preventive maintenance. See Step 18 and note.

The invitation to bid should include agreement to a penalty clause, which should exact money penalties for failure to complete the installation by a specific date. This should be the date on which the installing firm must indicate that the installation is complete, operable and up to specifications; it is at this point that the local plan for final testing and approval should begin to operate. See Step 18.

Note especially the Purchase Guide, page 280, III, 1, on the requirement to submit stock models; p. 281, A and B, on submitting product samples before opening of bids. It is recommended that the bidder be required to install a single, fully equipped booth for this purpose, fed from an actual console, if such is required.

16. The committee should read very carefully the Purchase Guide, page 280, IV, on "Testing the Equipment," particularly IV, C, 5 on "subjective evaluation."

In making the final selection, the particular brand names recommended by the committee should be given the highest priority.

17. In the period after the contract has been let, and before completion of the installation, the committee can turn its attention to (a) securing materials, or preparing drill scripts according to plan; (b) considering the question of adequate tests, particularly those of listening comprehension and speaking production. See Brooks, Chapter 12, Stack, Chapter IX, Delattre, pp. 77-93.

If laboratory recordings are to be made locally, and if a professional recorder and microphone have been included in the equipment list, it would be advantageous to have them available at this time, since some practical recording experience is advisable, both to work up a suitable recording technique and to check the adequacy of the scripts.

18. The most crucial period in the acquisition of a complete installation is the period between claimed completion and final approval, acceptance, and payment. This period should extend into at least a month of normal use in a regular shcool term. During this period two steps must be taken, both of vital importance for the ultimate success of the program:

These steps are discussed in some detail beginning on page 8a.

a. The performance characteristics must be checked in minute detail.

b. An effective program of preventive maintenance must be devised.

Notes to Step 18, page 8:

Even if reliable criteria are used in making the original choice of equipment, there is a vast difference in technical complexity between a simple demonstration or trial arrangement, and a complete, multiple-position installation. Hence the need for precise checking of details of performance.

Equipment for making instrumental measurements of laboratory performance is seldom available; such measurements are not easy to make even under the best of conditions, and the lack of adequate standards can also, in the practical case, compound confusion. Surprising as it may seem, it is readily possible for a language teacher to learn to check the sound quality of an installation by ear, without any technical knowledge whatever.* It is therefore recommended that one member of the committee, a language teacher, be made responsible for this final check-out.

Subjective checking procedures: A tape recording is made, using the professional recorder and microphone, if available, so that the quality of the recording will be beyond question. The recording should be made by someone other than the person who is to be the judge of the quality of reproduction when the tape is played over the language laboratory system. Record three lists of English words, about twenty words in each list, in a random order not known to the listener: (1) a list which contrasts the initial voiceless th-sound, as in thin, with the initial s-sound, as in sin; (2) a list which contrasts initial f with initial s, e.g. fin with sin; (3) a list which contrasts initial voiceless th with initial f, e.g. thin with fin. Leave a space between words equal to the time necessary to repeat the word silently, plus about one-half second. Contrasting pairs should not appear together oftener than chance would dictate. This tape is now played over the system, using a tape recorder or tape player at the console; judging is done from a student position. The listener should be able to determine effortlessly which word is being said, as he takes dictation from each of the recorded lists. Listen briefly at each of the student positions to make sure that the quality is identical in each. If there are recorders at any of the student positions, a further check will be necessary. Record the test tape, played at the console, onto each of the student machines, using the switching facilities provided. Then working at each booth in turn, record your own voice in the spaces as if you were a student imitating a master tape. Now play back the tape on the student machine and judge the quality as above or, preferably, have still another person judge it. If initial th, f, and s are not clearly and independently distinguishable under any of these conditions, then something is wrong.

* Professor Pierre Delattre, in Audio-Visual Instruction for May 1960, has treated important aspects of this question. Portions of these notes are essentially an expansion of his valuable contribution.

An installation may pass these tests and yet have an unnatural, excessively tinny sound. Make another recording on the professional recorder. Two voices, a woman's and a man's, should be used, each reading alternate lines of a passage of connected prose. The woman's voice should be an average soprano, the man's a medium baritone. When played over the system, or recorded onto the student recorders, if the woman's voice sounds natural and the man's does not, the system is not reproducing the lower tones which are characteristic of the male voice.

Quite apart from the faulty characteristics which can cause a system to fail any of the above tests, there can (and usually do) exist other undesirable features which can seriously inhibit the learner. The existence of extraneous noise in the headphones is an almost certain indication that some of the specifications are not being met. Listen for <u>any</u> non-speech noises; they shouldn't be there. The only permissible non-speech noise is a gentle background hiss, which should be scarcely audible beneath the recorded voice. Turn up the volume to a blank spot on the tape until the hiss is quite loud; the voice, when it comes on, should be deafening by comparison. Other kinds of noise are: hum, a steady tone of low or medium pitch which is present all the time when the equipment is turned on, and may or may not increase with changes in the volume setting; various kinds of static-like noises, called by technicians, depending on the source, "AC hash," "frying," or "grid whine"; a metallic ringing or echoing sound, called "microphonics"; "crosstalk," the name given to the appearance of an unwanted voice or voices in the background of the program. It is not uncommon for two or more of these noise types to produce an annoying jumble of extraneous sound in the background of the recorded voice.

Read the <u>Purchase Guide</u>, p. 280, IV for procedures for checking mechanical features. It must be emphasized that it is entirely irrelevant what the causes of any of these unwanted phenomena may be. Cause and cure are for the installing firm to determine; it is the teacher's responsibility to point out the difficulties, and insist that they be corrected.

<u>Preventive maintenance</u>: The basic components of no equipment presently available were originally designed with the service requirements of the language laboratory in mind. In such service they will receive more use in a month than they were designed to furnish in a year. A service contract frequently provides only emergency service, which, by definition, implies a breakdown, with its attendant frustrations. School or student help can readily be trained to provide preventive maintenance, which is the key to continued high quality mechanical and electrical performance.

Probably the most vulnerable points are these, all in the tape mechanisms: all rubber or rubber-like surfaces ("idler wheels," "drive wheels," "capstan rollers"); vital non-rubber

surfaces are the "capstan" itself, the metal rod which drives the tape by squeezing it against the "capstan roller," and the recording and playback "heads." All these surfaces require daily cleaning with an alcohol cleaning agent such as Shellacol (not carbon tetrachloride!). The recording and playback heads are cleaned more readily with special cleaning agents recommended by the manufacturer. If these vulnerable points do not receive frequent attention, the sound quality will deteriorate badly, and mechanical operation will become more and more erratic.

Potential electrical failure can often be spotted by scheduled periodic critical listening to the sound available at each student position. Listen for the fricative consonants, and for the appearance of extraneous noises of the kind described above. Deteriorating sound at any point can then be brought to the attention of the manufacturer or service representative before it becomes a serious problem.

A detailed schedule of preventive maintenance should be worked out, showing what is to be checked, how often, by whom, and what the procedure is. The manufacturer or his agent should be able to supply this information, but it must be pointed out that they are sometimes understandably reluctant to discuss details of maintenance in advance. One can often do better by having a local service agency, one which does extensive service on high fidelity sound equipment, look over the completed installation and point out the proper maintenance procedures to those who will draw up the maintenance schedule. Such a service agency may or may not know anything about language laboratories as such, and their technicians may be surprised at insistence on high quality reproduction of speech. But they will be entirely familiar with the kinds of maintenance problems which will inevitably arise, since they are common to all types of recording and playback equipment.

The sound quality and reliability of language laboratory equipment in operation throughout the country ranges from excellent to completely unacceptable. Those who have visited many laboratories, however, must consider that the average installation exhibits a kind of technical mediocrity which is inconsistent with the expenditure of effort, time, and money involved. This mediocrity stems in part from equipment hastily chosen and hastily approved, and in part from entirely avoidable deterioration due to lack of preventive maintenance procedures. Our students deserve better.